



Chemeca2026
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28 – 30 September 2026
Melbourne, Australia



*Chemeca 2026 and Hazards Australasia
28 – 30 September, Melbourne, Australia*

Management of Ageing Plants in Singapore’s Major Hazards Installations (MHIs)

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ABSTRACT

In Singapore, our petrochemical sector has evolved from a 1960s refining hub into a world-leading, integrated chemical cluster by the 2000s, driven by the strategic development of Jurong Island. Decades later, most of these plants which are typically classified as Major Hazard Installations (MHIs) had aged over time, possibly creating safety concerns. Therefore, it is imperative that MHIs demonstrate that they have established appropriate and robust maintenance regimes to properly manage ageing plant and prevent major accidents.

Workplaces designated as MHIs in Singapore are required to demonstrate that all necessary measures are taken to reduce the risk of major accidents to as low as is reasonably practicable and to limit the consequences of major accidents. Recent analysis of reported process-related incidents (PRIs) from MHIs shows that approximately 72% of PRIs were due to mechanical causes, with three key issues identified: (1) corrosion management of assets, (2) flange management, and (3) management of ageing plant issues. Since July 2025, Singapore's Major Hazards Department (MHD) under the Ministry of Manpower has established the Mechanical Integrity Programme (MIP) for MHIs, targeting these three key issues.

This paper presents MHD's initiative to address MHIs' mechanical integrity issues through a more focused and targeted approach. The MIP's main objective is proper management of ageing plant to prevent loss of containment, extend equipment lifespan, and improve reliability.

KEY WORDS

Safety case, Singapore, Mechanical Integrity, Ageing Plant

BIOGRAPHY

Randy serves as a Principal Specialist in the Major Hazards Department, responsible for managing the Safety Case regulatory system for Singapore's Major Hazards Installations (MHIs). He specialises primarily in process safety management and occupational safety. He contributed actively to standards development and is currently a member of the workgroup for hydrogen technologies with the Singapore Chemical Industry Council.

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